

REMARKS

In response to the Office Action mailed February 3, 2004, Applicant respectfully requests reconsideration. Claims 1-35 were previously pending in this application. Claims 1-19 are cancelled without prejudice or disclaimer and claims 20, 25-28, 30, 32, 33, and 34 are amended herein. The application as presented is believed to be in condition for allowance.

In paragraph 2, the Office Action required restriction to either the claims of Group I (claims 1-19) or the claims of Group II (claims 20-35). In a telephone discussion with the Examiner on January 21, 2004 (the substance of which is summarized herein), Applicant elected the claims of Group II (claims 20-35). Accordingly, by this Amendment, Applicant cancels the claims of Group I without prejudice or disclaimer, as the claims of Group II have been elected for prosecution. Applicant reserves the right to pursue the cancelled subject matter in a divisional application.

In paragraph 6, the Office Action rejected claims 1-35 under 35 U.S.C. §112, second paragraph. The rejection of claims 1-19 is moot in view of their cancellation. With respect to the remaining claims, the Office Action asserted that the acronym ELVID in claims 20-35 should accompany a definition of the acronym. Applicant has amended independent claims 20, 27, 30, and 33, so that the acronym ELVID is spelled out as "enterprise logical volume identifier." Accordingly, it is respectfully requested that the rejection of claims 20-35 under 35 U.S.C. §112, second paragraph be withdrawn.

In paragraph 7, the Office Action rejected claims 20-35 under 35 U.S.C. §103(a) as purportedly being obvious over McBrearty (6,216,211) in view of alleged well known distributed mirroring techniques. Applicant respectfully traverses this rejection.

Applicant notes that on Page 6, the Office Action asserts that "[i]t is well known to map and translate ELVIDs." The Office Action further asserts that, "the claimed database operations are well known to those of skill in the networking art" and "Applicant's using databases to assign ELVIDs and mapping and translation are obvious variations of these well known networking features." Applicant traverses each of these assertions and any others based on allegedly well known art, as Applicant disagrees that any well known art exists that when combined with McBrearty, would have rendered obvious any of Applicant's claims. MPEP §2144.03 requires that if Applicant challenges a factual assertion as not properly based upon common knowledge,

the Examiner must support the finding with adequate evidence (MPEP, §2144.03, page 2100-133 of 8th Ed., Rev. 1, Feb. 2003). Accordingly, if the rejection is to be maintained, the Examiner is requested to cite one or more references in support of these assertions.

The Office Action asserts that McBrearty teaches a system in which logical volume identifiers are used to access logical volumes and that “it would have been obvious to one of ordinary skill in the networking art at the time of the invention that the claimed invention differed from the teachings of McBrearty et al only by a degree, e.g. the claimed ELVIDs.” The Office Action further asserts that “the definition of enterprise is broad and changes from person to person who defines it. Examiner taking in a context of networking interprets that it would be equivalent to storage devices distributed around a network instead of storage devices connected to a single computer system.”

It is respectfully pointed out that the above-quoted assertions in the Office Action demonstrate that hindsight has improperly crept into the analysis, as a determination of what would have been obvious at the time of the invention must be reached without resort to Applicant’s disclosure.

To clarify the distinction between an ELVID and a conventional logical volume identifier, Applicant has amended the claims to indicate that an ELVID uniquely identifies a logical volume among a plurality of logical volumes stored on a plurality of storage elements. While Applicant does not dispute that McBrearty teaches the use of minor numbers to identify logical volumes, the minor numbers of McBrearty are not ELVIDs. An ELVID is unique among logical volumes stored on multiple different storage systems. In McBrearty, the minor numbers used to identify logical volumes are only unique within a single computer system. Nowhere does McBrearty disclose or suggest that the minor numbers used to identify logical volumes are unique across multiple storage systems.

Further, the term “storage element” cannot be read on a single storage device, such as the disks 50, 52, and 54 disclosed by McBrearty, as Applicant has amended the claims to clarify that a storage element is a unitary storage system that comprises at least one storage device. Disks 50, 52, and 54 are not unitary storage systems that comprise at least one storage device. Rather, they themselves are storage devices within a single computer system.

Each of the claims distinguishes over McBrearty as discussed below.

Claim 20

Claim 20 is directed to a method of accessing a first of a plurality of logical volumes stored on a plurality of storage elements, wherein each of the plurality of storage elements is a unitary storage system comprising at least one storage device, and wherein at least one of the plurality of volumes is stored on each of the plurality of storage elements. The method comprises steps of: determining an enterprise logical volume identifier (ELVID) for the first logical volume, wherein the ELVID uniquely identifies the first logical volume among the plurality of logical volumes; and using the ELVID to access the logical volume.

As should be clear from the discussion above, McBrearty fails to disclose or suggest determining an enterprise logical volume identifier (ELVID) for a first logical volume or using the ELVID to access the logical volume, as no identifier in McBrearty is an ELVID that uniquely identifies a first logical volume among a plurality of logical volumes on a plurality of storage systems, each of which comprises a unitary storage system.

Thus, claim 20 patentably distinguishes over McBrearty. Accordingly, it is respectfully requested that the rejection of claim 20 under 35 U.S.C. §103(a) be withdrawn.

Claims 21-26 depend from claim 20 and are patentable for at least the same reasons. Accordingly, it is respectfully requested that the rejection of claims 21-26 be withdrawn.

Claim 27

Claim 27 is directed to a host computer for use in a computer system that includes a plurality of storage elements storing a plurality of logical volumes, wherein each of the plurality of storage elements is a unitary storage system comprising at least one storage device, and wherein at least one of the plurality of logical volumes is stored on each of the plurality of storage elements. The host computer comprises: a processing unit; and an enterprise logical volume identifier (ELVID) interface module to translate requests for access to a first logical volume of the plurality of logical volumes to an ELVID for the first logical volume that uniquely identifies the first logical volume among the plurality of logical volumes.

As should be clear from the discussion above, McBrearty fails to disclose or suggest an enterprise logical volume identifier (ELVID) interface module to translate requests for access to a first logical volume to an ELVID for the first logical volume, wherein the ELVID uniquely

identifies the first logical volume among a plurality of logical volumes stored among a plurality of storage elements which each comprises a unitary storage system. In fact, McBrearty does not even disclose or suggest a computer system that includes a plurality of storage elements storing a plurality of logical volumes.

Thus, claim 27 patentably distinguishes over McBrearty. Accordingly, it is respectfully requested that the rejection of claim 27 under 35 U.S.C. §103(a) be withdrawn.

Claims 28 and 29 depend from claim 27 and are patentable for at least the same reasons. Accordingly, it is respectfully requested that the rejection of claims 28 and 29 be withdrawn.

Claim 30

Claim 30 is directed to a host computer for use in a computer system that includes a plurality of storage elements storing a plurality of logical volumes, wherein each of the plurality of storage elements is a unitary storage system comprising at least one storage device, and wherein at least one of the plurality of logical volumes is stored on each of the plurality of storage elements. The host computer comprises: a processing unit; and an enterprise logical volume identifier (ELVID) module to translate an ELVID for a first logical volume of the plurality of logical volumes to a physical storage location for the first logical volume, wherein the ELVID uniquely identifies the first logical volume among the plurality of logical volumes.

As should be clear from the discussion above, McBrearty does not disclose or suggest an enterprise logical volume identifier (ELVID) module to translate an ELVID for a first logical volume to a physical storage location for the first logical volume, wherein the ELVID uniquely identifies the first logical volume among a plurality of logical volumes stored among a plurality of storage elements, each of which comprises a unitary storage system.

Thus, claim 30 patentably distinguishes over McBrearty. Accordingly, it is respectfully requested that the rejection of claim 30 under 35 U.S.C. §103(a) be withdrawn.

Claim 31

Claim 31 is directed to a storage management controller to manage access to at least one of a plurality of logical volumes stored on a plurality of storage elements, wherein each of the plurality of storage elements is a unitary storage system comprising at least one storage device,

and wherein at least one of the plurality of logical volumes is stored on each of the plurality of storage elements. The controller comprises: an access management module to provide access to the at least one of the plurality of logical volumes by providing a physical storage address associated with an enterprise logical volume identifier (ELVID) for the at least one of the plurality of logical volumes, wherein the ELVID for the at least one of the of the plurality of logical volumes uniquely identifies the at least one of the plurality of logical volumes among the plurality of logical volumes.

As should be clear from the discussion above, McBrearty fails to disclose or suggest an access management module to provide access to the at least one of a plurality of logical volumes by providing a physical storage address associated with an enterprise logical volume identifier (ELVID) for the at least one of the plurality of logical volumes, wherein the ELVID uniquely identifies the at least one of the plurality of logical volumes among a plurality of logical volumes that are stored on a plurality of storage elements, each of which comprises a unitary storage system.

Thus, claim 31 patentably distinguishes over McBrearty. Accordingly, it is respectfully requested that the rejection of claim 31 under 35 U.S.C. §103(a) be withdrawn.

Claim 32 depends from claim 31 and is patentable for at least the same reasons. Accordingly, it is respectfully requested that the rejection of claim 32 be withdrawn.

Claim 33

Claim 33 is directed to a computer system comprising: a plurality of host computers; a plurality of storage elements to store a plurality of logical volumes thereon, wherein each of the plurality of storage elements is a unitary storage system comprising at least one storage device, wherein at least one the plurality of logical volumes is stored on each of the plurality of storage elements; and means for assigning an enterprise logical volume identifier (ELVID) to at least one of the plurality of logical volumes to be accessed by the host computers, wherein the ELVID for the at least one of the plurality of logical volumes uniquely identifies the at least one of the plurality of logical volumes among the plurality of logical volumes.

As should be clear from the discussion above, McBrearty fails to disclose or suggest means for assigning an enterprise logical volume identifier (ELVID) to at least one of a

plurality of logical volumes to be accessed by a host computer, wherein the ELVID uniquely identifies the at least one of the plurality of logical volumes among a plurality of logical volumes that are stored among a plurality of storage elements, each of which comprises a unitary storage system.

Thus, claim 33 patentably distinguishes over McBrearty. Accordingly, it is respectfully requested that the rejection of claim 33 under 35 U.S.C. §103(a) be withdrawn.

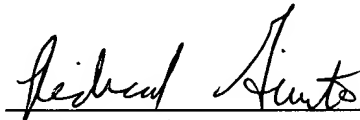
Claims 34 and 35 depend from claim 33 and are patentable for at least the same reasons. Accordingly, it is respectfully requested that the rejection of claims 34 and 35 be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below to discuss any outstanding issues relating to the allowability of the application.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,
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